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Wang

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(54) **GAME MACHINE WITH TAMPER RESISTANCE FUNCTION**

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A63B 71/00 (2006.01)
A63F 9/00 (2006.01)

(52) **U.S. Cl.**
USPC **273/447**; 273/440; 273/441; 273/454; 221/210

(58) **Field of Classification Search**
USPC 74/406; 221/210, 211; 273/451, 447, 273/459, 448, 454, 460, 440, 441; 194/215, 194/229, 239, 293, 350; 312/114, 223.1, 312/352
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,170,413	A *	2/1965	Dorey	105/282.3
5,524,790	A *	6/1996	Cho	221/150 HC
5,711,530	A *	1/1998	Lewis	273/448
6,315,157	B1 *	11/2001	Halliburton	221/87
7,446,302	B2 *	11/2008	Mason et al.	250/222.1
7,519,451	B2 *	4/2009	Hartnell et al.	700/244
7,635,131	B2 *	12/2009	Fukazawa et al.	273/447
7,742,837	B2 *	6/2010	Hair et al.	700/236
7,841,599	B2 *	11/2010	Todokoro	273/447
8,016,292	B1 *	9/2011	Yang et al.	273/451
2002/0067002	A1 *	6/2002	Yoshida et al.	273/447
2002/0117509	A1 *	8/2002	Whitten et al.	221/9
2003/0097793	A1 *	5/2003	Kowalczyk et al.	49/333
2006/0042481	A1 *	3/2006	Daniel et al.	100/260
2006/0094489	A1 *	5/2006	Fukazawa et al.	463/7
2010/0133302	A1 *	6/2010	Noda et al.	222/590

* cited by examiner

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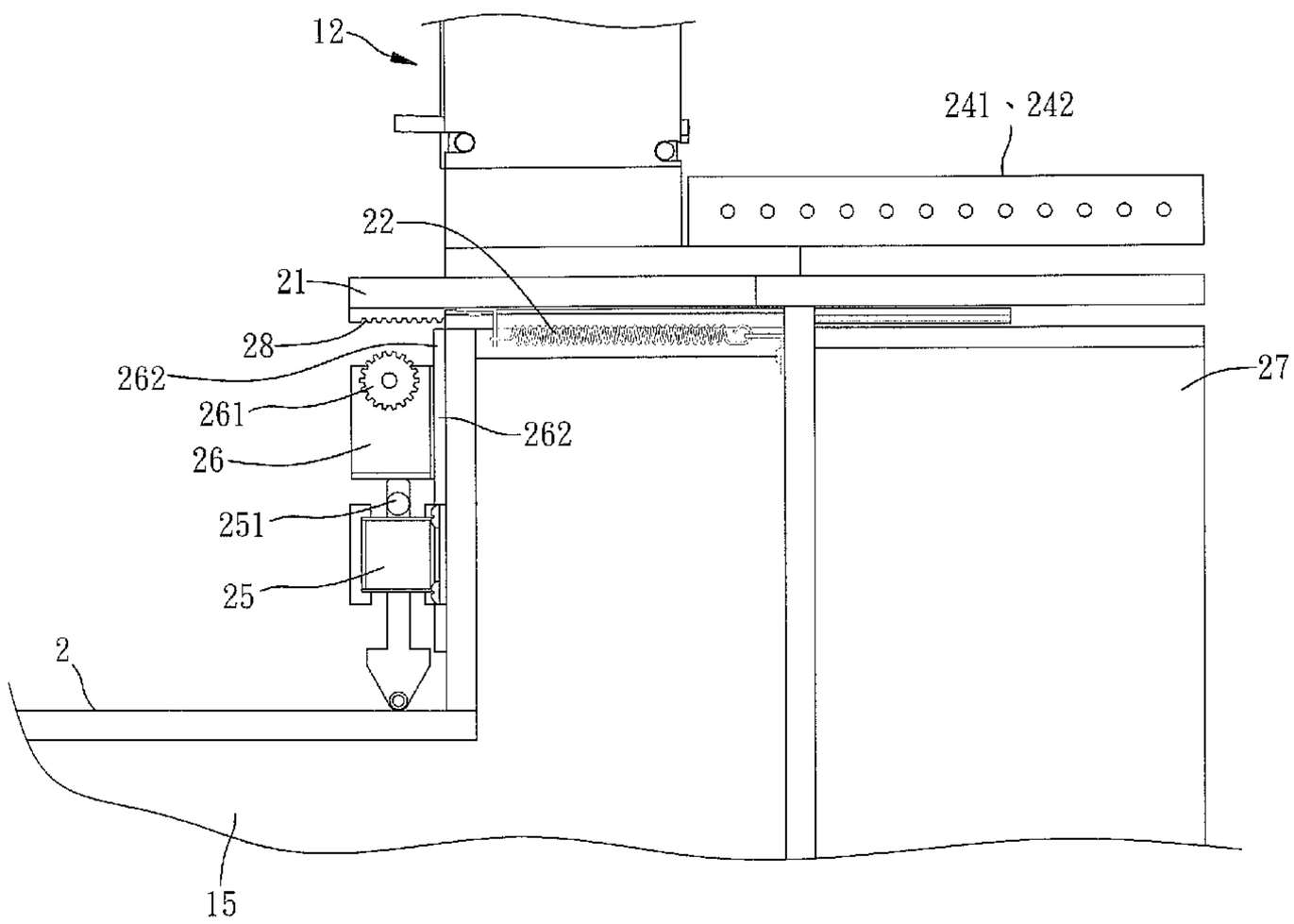
(57) **ABSTRACT**

A game machine includes a cabinet, a shutter, a sensor and a drive mechanism. The cabinet has a chute for guiding items therein to a hatch accessible to a user. The shutter is normally disposed in a closed position in the cabinet to cover the chute in order to prevent the item from entering the hatch. The sensor is provided for detecting whether an item is deposited on the shutter, and if yes, sending out a signal. Upon reception of the signal, the drive mechanism is activated to cause the shutter to move to an opening position uncovering the chute to allow entry of the detected item into the hatch.

4 Claims, 7 Drawing Sheets



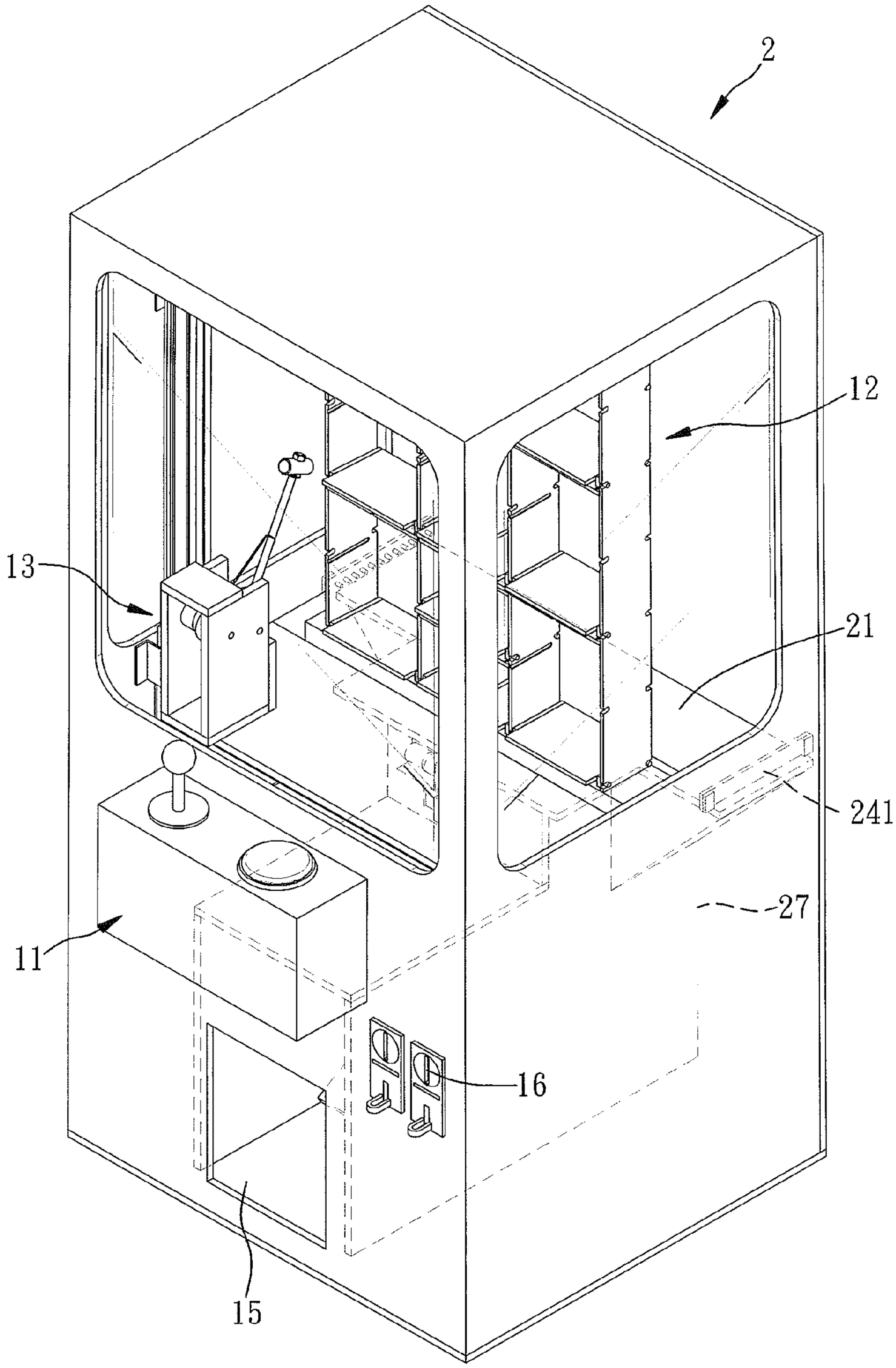


FIG. 1

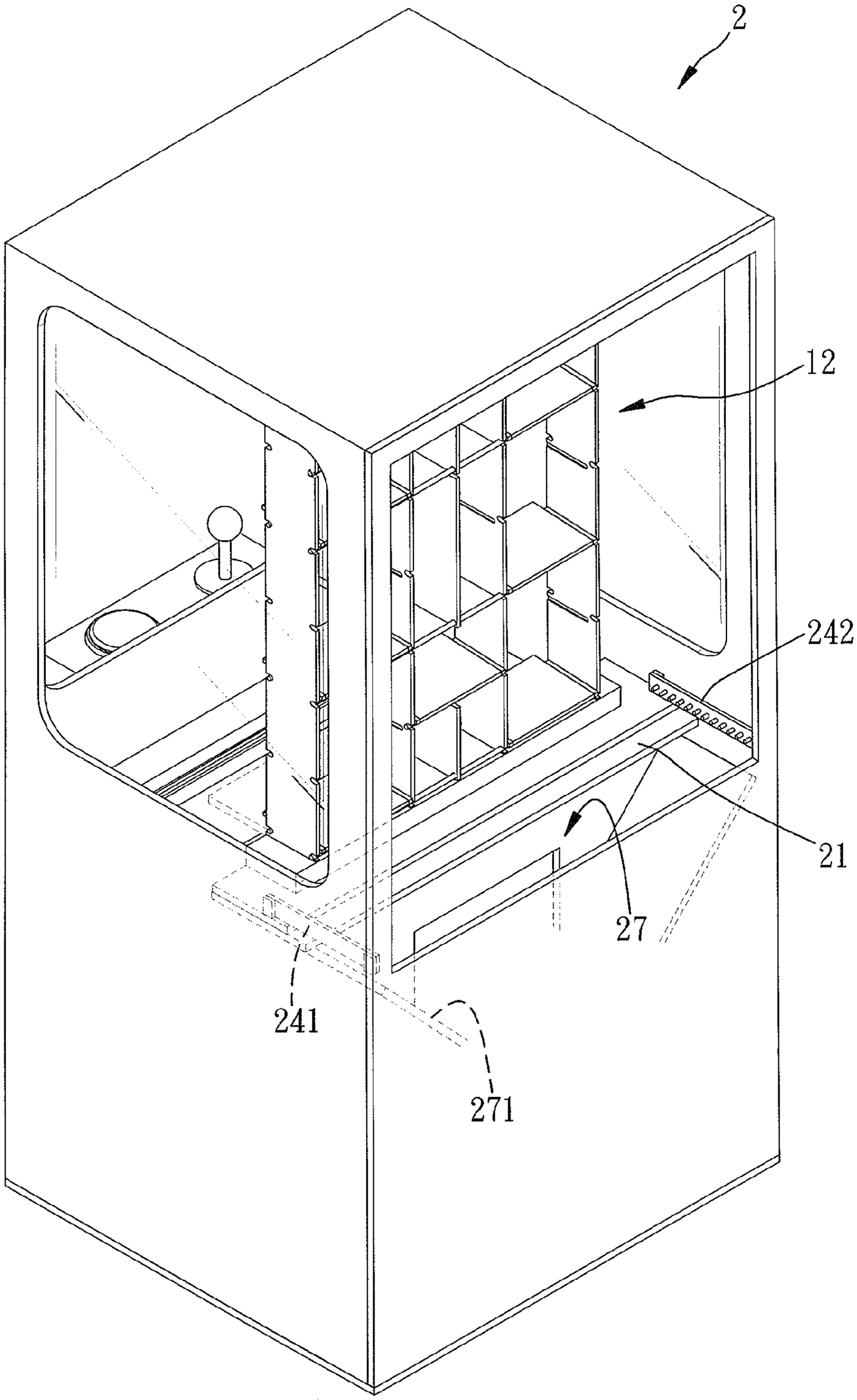


FIG. 2

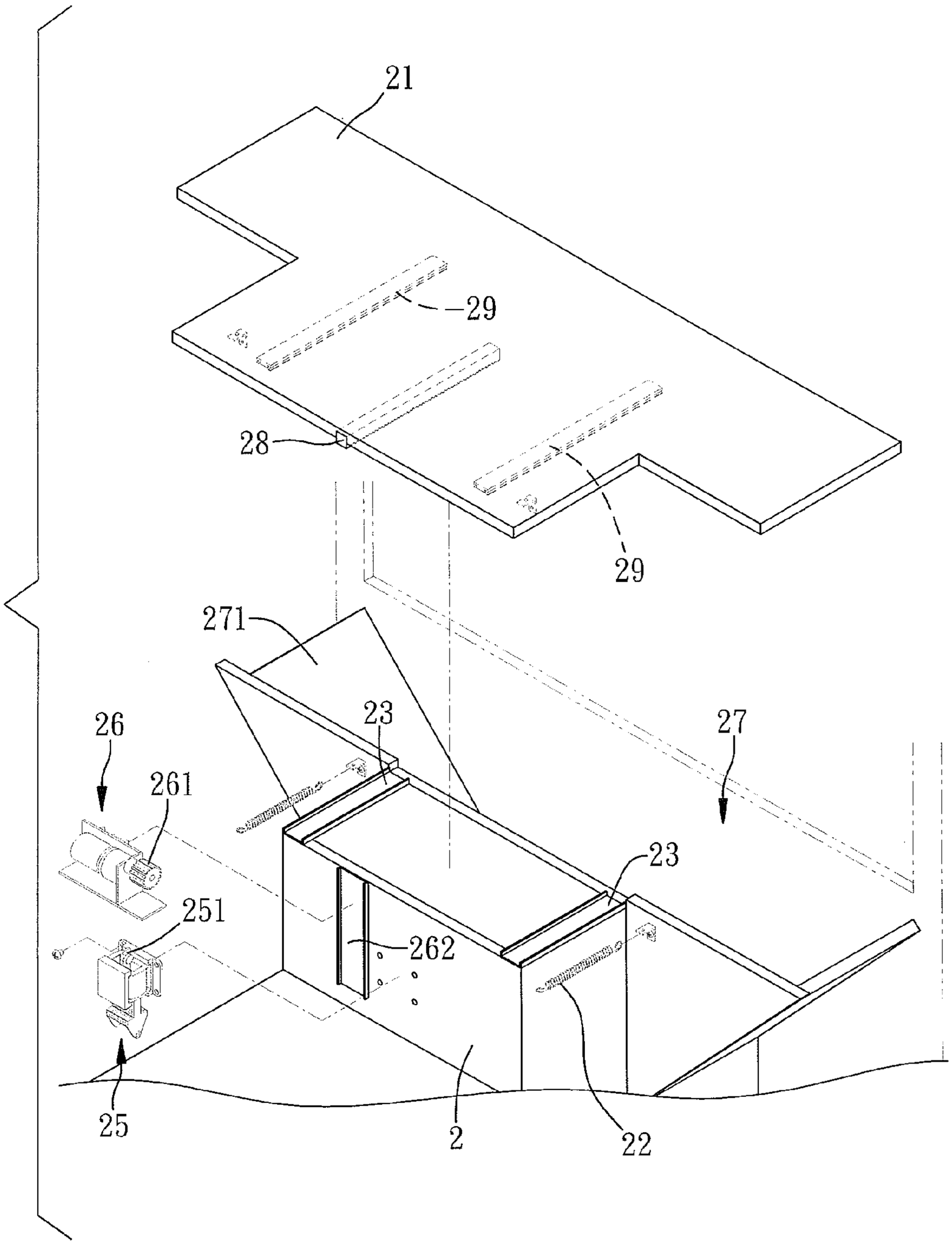


FIG. 3

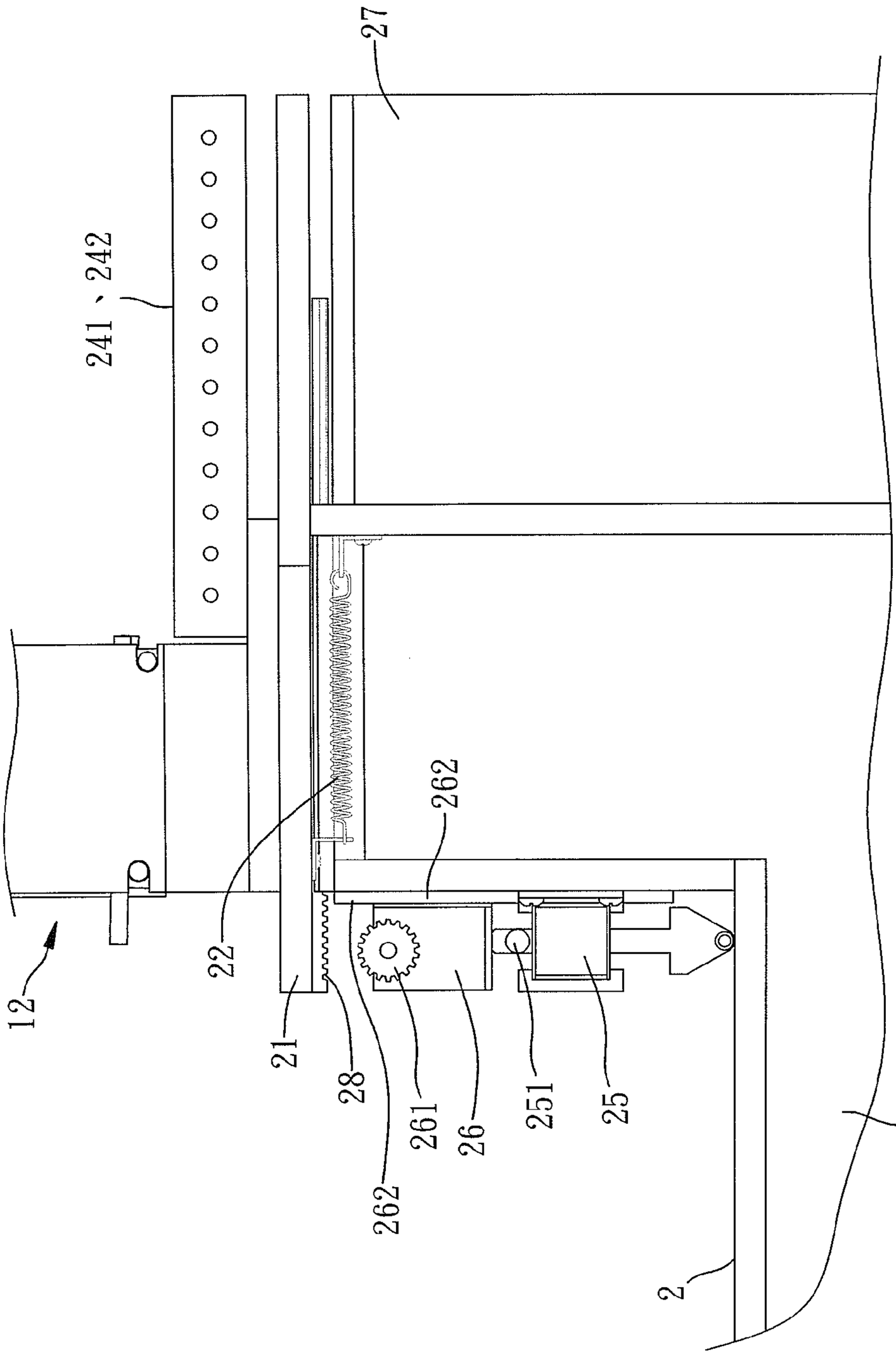


FIG. 4

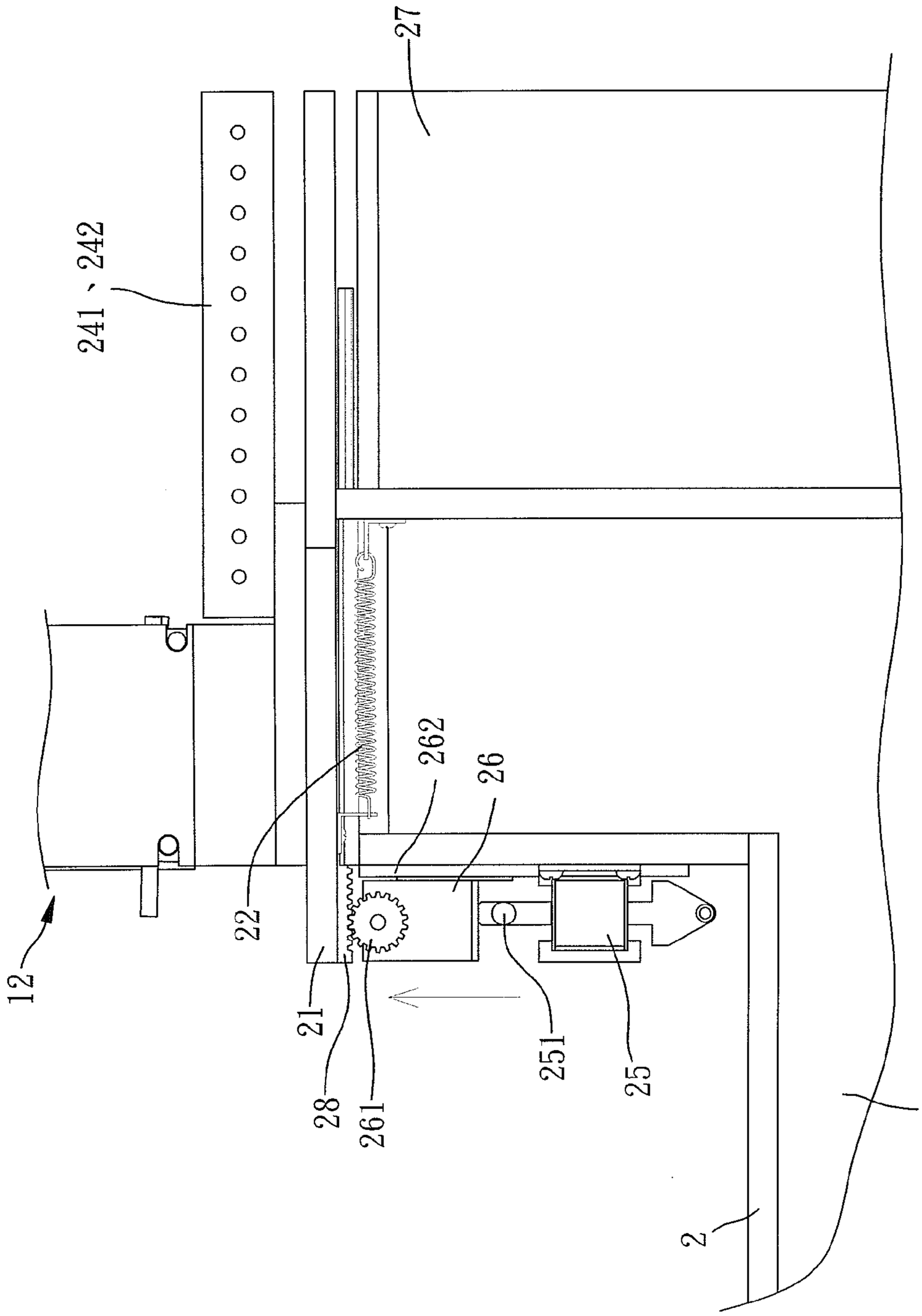


FIG. 5

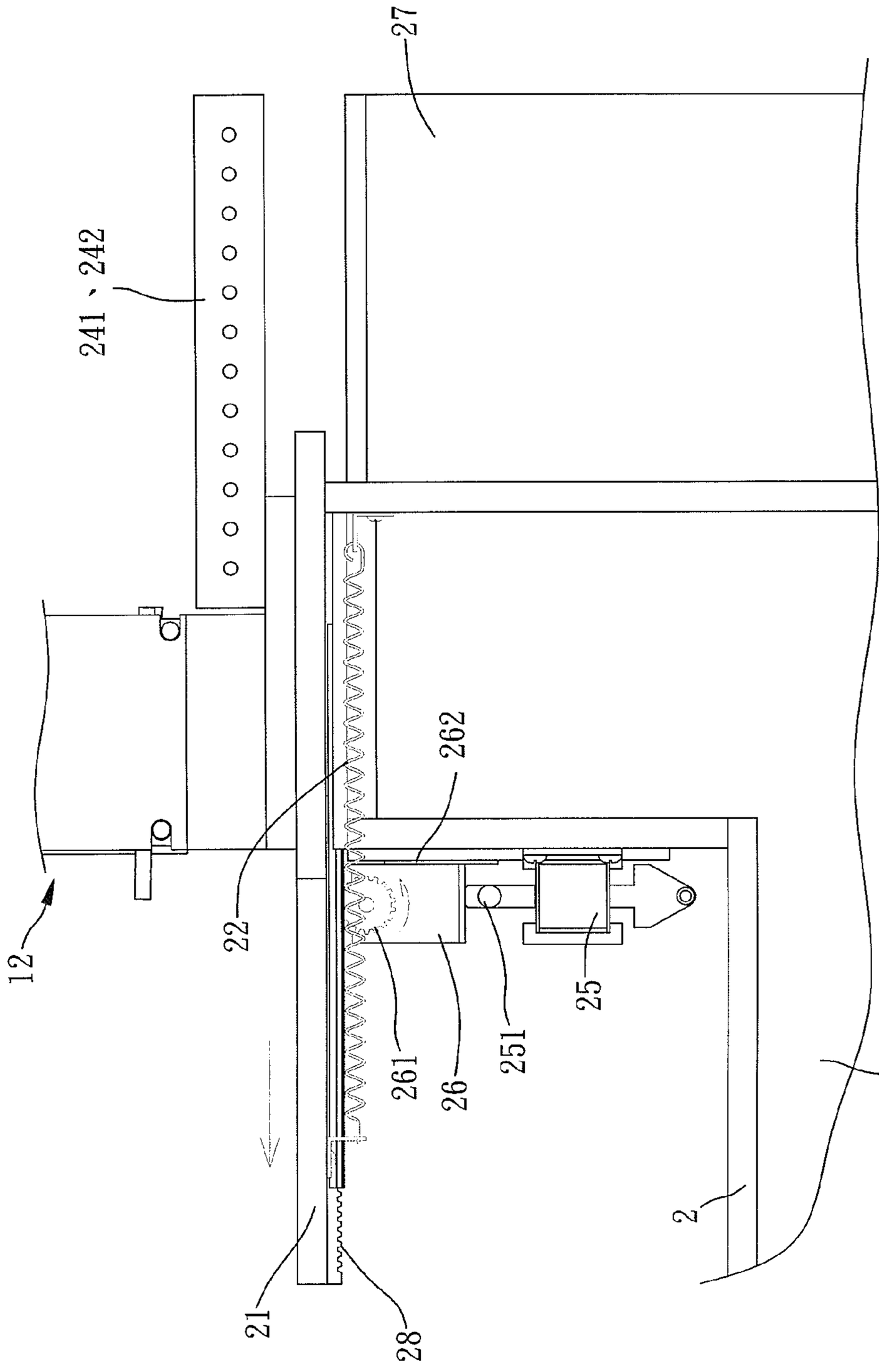


FIG. 6

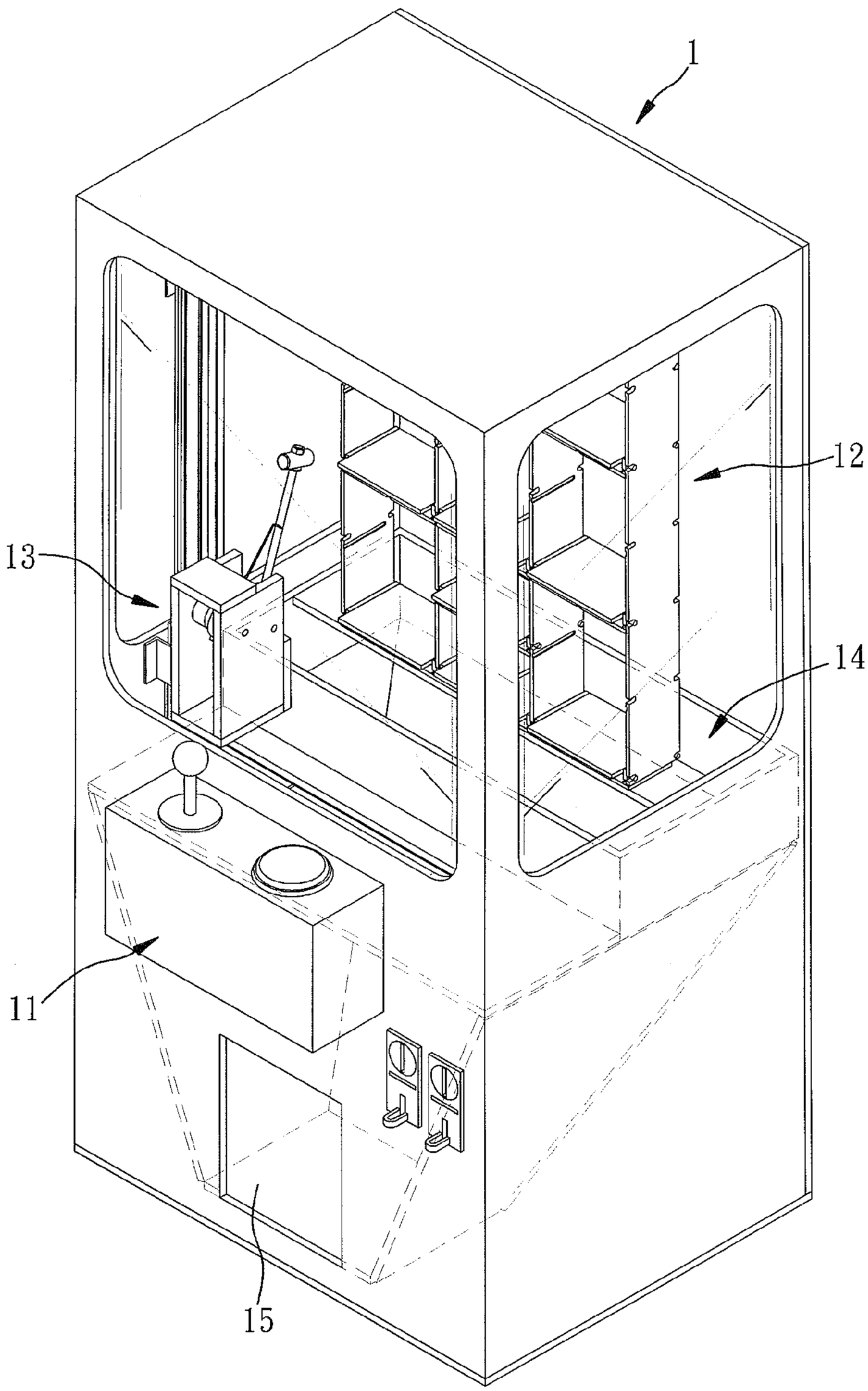


FIG. 7 (PRIOR ART)

GAME MACHINE WITH TAMPER RESISTANCE FUNCTION

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a game machine and more particularly to a game machine with tamper resistance function.

2. Description of the Related Art

There are numerous game machines, such as craw cranes, which are designed to dispense items or prizes. Generally, craw cranes require the exercise of skill on behalf of the player to maneuver a capturing device, such as a claw which is suspended on a chain over a playing field which has been filled with prizes. Besides the player skill, it is understood that the success rate winning a prize is dependent on several other factors, including operator settings, type of machine, and prizes available (size, density, and distribution). However, it is frustrated to know that a prize may be lost due to a specific crane configuration, which is tricky and extremely unfair to the player. For example, all modern claw machines incorporate some means for the owner to adjust at least the strength of the claw's grip and how closely the claw's fingers pull together. Some machines incorporate a feature called two-level claw power, which, when enabled, causes the claw to at first grip at full strength, but then weaken its grip to the normal level after a brief delay. This can cause the crane to initially pick up the prize, but then drop it.

To increase the fairness and provide a game machine capable of preventing a player from feeling unfairness, another type of game machine is disclosed as shown in FIG. **7**, which generally includes a cabinet **1**, a controller **11** disposed on a front of the cabinet **1**, shelves **12** for accommodation of items or prizes, and a hammer mechanism **13** electrically coupled to the controller **11**. An operator can manipulate the controller **11** to control positioning of the hammer mechanism **13**. And hitting motion of the hammer mechanism **13** onto the shelves **12** may be translated to vibration of the shelves **12** causing one or more items falling off the shelves **12** and dispensed through a chute **14** into a hatch **15** for collection. However, since the chute **14** is always open at its interior port for receiving items, the machine may easily be tampered by tilting the cabinet **1** to cause the items to fall out of the shelves **12** and through the chute **14** into the hatch **15**, causing a big loss for the machine owner.

SUMMARY OF THE INVENTION

To solve the problems mentioned above, the present invention provides an improved game machine with an anti-tampering shutter which is designed to frustrate tampering with the machine such as by tilting the cabinet to cause items to fall out.

Specifically, the game machine includes a cabinet, the shutter disposed in the cabinet, a sensor for detecting an item and a drive mechanism for movement of the shutter. The cabinet includes a chute for guiding items therein to a hatch accessible to a user. The shutter is disposed normally in a closed position to cover the chute to prevent items from entering the hatch. The sensor is configured to detect whether an item is deposited on the shutter, and if yes, send out a signal. The drive mechanism is configured to be activated by the signal to cause the shutter to move to an opening position uncovering the chute to allow entry of the detected item into the hatch.

Since an interior port of the chute is normally covered by the shutter, the blocking of the port makes unauthorized access to the protected items harder and therefore frustrates tampering. Further benefits and advantages of the present invention will become apparent after a careful reading of the detailed description with appropriate reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

A game machine according to the invention will now be described, by way of example, with reference to the accompanying drawings, in which:

FIG. **1** is an isometric view of the game machine;

FIG. **2** is another isometric view of the game machine taken from another angle;

FIG. **3** is a fragmentary exploded perspective view of the game machine;

FIG. **4** is a fragmentary side view of the game machine, showing that the shutter is in a closed position;

FIG. **5** is a view similar to that of FIG. **4** but with a gear driven by a motor being lifted to mesh with a rack underneath the shutter;

FIG. **6** is a view similar to that of FIG. **5** but with the shutter located in an opening position; and

FIG. **7** is a prior art.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

Referring to FIGS. **1-6**, a game machine is provided in accordance with the preferred embodiment of the present invention. The game machine includes a cabinet **2**, an anti-tampering shutter **21** disposed in the cabinet **2**, a set of sensors **241**, **242** for detecting items on the shutter **21** and a drive mechanism (FIG. **3**) for movement of the shutter **21**.

As best shown in FIG. **1**, the cabinet **2** includes shelves **12** for accommodation of items or prizes and a chute **27** for guiding falling items to a hatch **15** accessible to a user. A controller **11** is disposed in a front of the cabinet **2** for controlling positioning of a hammer mechanism **13** to hit against shelves **12** so as to shake items out of the shelves **12**. Referring to FIG. **2**, if the chute **27** is not shut by the shutter **21**, the falling items may further drop into the chute **27** which has an enlarged port defined by tilted guide walls **271** for access of the items into the chute **27**.

As shown in FIG. **1** or **4**, the shutter **21** is disposed normally in a closed position to cover the chute **27** to prevent items from entering the hatch **15**. The set of sensors **241**, **242** is provided for detecting whether an item is deposited on top of the shutter **21**, and if yes, sending out a signal.

Referring to FIG. **3**, the drive mechanism is configured to be activated by the signal to cause the shutter **21** to move to an opening position uncovering the chute **27** to allow entry of the detected item. Specifically, the drive mechanism includes a rack **28** mounted underneath the shutter **21**, a motor **26** electrically coupled to the set of the sensors **241**, **242**, a gear **261** mounted around a driving shaft of the motor **26**, and a lifting member **25** electrically coupled to the set of the sensors **241**, **242**.

Referring to FIG. **4**, the lifting member **25** is configured to be activated by the signal to lift the motor **26** toward the shutter **21** to have the gear **261** mesh with the rack **28**, as shown in FIG. **5**, which in turn brings the shutter **21** to the opening position uncovering the chute **27**, as shown in FIG. **6**. In this example, the lifting member **25** is a solenoid containing a central rod **251** on which the motor **26** is seated. The

solenoid **25** causes the central rod **251** to move upward to lift the motor **26** and therefore have the gear **261** mesh with the rack **28**. Activation of the motor **26** by the signal drives the gear **261** to rotate which in turn displaces the rack **28** and therefore have the shutter **21** move to the opening position. Preferably, as shown in FIG. **3**, a track **262** may be included in the drive mechanism to stabilize the lifted motor **26**, and a pair of rails **23** may be provided to guide the movement of the shutter **26** which is equipped at bottom with a pair of sliding bars **29** corresponding to the rails **23**.

Referring again to FIG. **3**, the drive mechanism further a pair of elastic members **22**, such as helical springs, each secured to the bottom of the shutter **21** with one end and to the cabinet **2** with the other end. Referring to FIG. **6**, the helical springs **22** are stretched so that if the gear **261** is further detached from the rack **28** because of downward movement of the central rod **251**, the helical springs **22** will draw the shutter **21** back to the closed position, as shown in FIG. **4**. The springs **22** normally maintain the shutter **21** in the closed position to frustrate tampering.

In operation, coins may be fed into a coin slot **16** (FIG. **1**) at the front of the cabinet **2** for energizing the game machine for play. When the game machine is energized, the set of sensors **241**, **242** and the drive mechanism are started up. Afterward, if any items are shaken out of the shelves **12** and fall down to the shutter **21**, the items on the shutter **21** will be detected by the set of sensors **241**, **242** and the signal will be send out. Upon reception of the signal, the lifting member **25** is activated to lift the motor **26** to have the gear **261** mesh with the rack **28** which in turn brings the shutter **21** to the opening position. At this time, the items will fall through the chute **27** into the hatch **15**. After that, since no items stay on the shutter **21**, the set of sensors **241**, **242** will send no signals out. Without the signal, the lifting member **25** will lose power causing the central rod **251** to retract and release the gear **261** from the rack **28**, and therefore the shutter **21** will be drawn back to the closed position by the elastic members **22**. This ensures that if the game machine is not used, the shutter **21** is always located in the closed position to frustrate tampering.

It is to be understood that the disclosed embodiments are illustrative in nature and the invention is not to be limited to any one or more embodiments except as set forth in the following claims.

What is claimed is:

1. A game machine comprising:

a cabinet including a chute for guiding items therein to a hatch thereof;

a shutter disposed normally in a closing position in the cabinet to cover the chute to prevent items from entering the hatch;

a sensor for detecting whether an item is deposited on the shutter, and if yes, sending out a signal; and

a drive mechanism including at least one elastic member formed with an end secured to the shutter and another end secured to the cabinet, a rack placed beneath the shutter, a motor electrically coupled to the sensor, a gear operatively connected to the motor, a lifting member adapted to move the motor toward the shutter to mesh the gear with the rack to bring the shutter into an opening position after receiving the signal, wherein the lifting member is further adapted to move the motor from the shutter to disengage the gear from the rack to allow the elastic member to abruptly return the shutter into the closing position when the signal is stopped.

2. The game machine of claim **1**, wherein the drive mechanism further includes a track disposed in the cabinet to stabilize the motor while the motor is lifted.

3. The game machine of claim **1**, further comprising a coin slot into which coins can be inserted for energizing the game machine for play, wherein the sensor and the drive mechanism are configured to function only when the game machine is energized by insertion of coins to the coin slot.

4. The game machine of claim **1**, wherein the chute includes tilted guide walls that together define a port for access of the item to the chute.

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